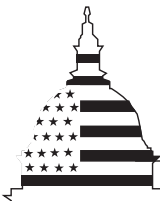


July 2001

ENVIRONMENTAL CONTAMINATION

Cleanup Actions at Formerly Used Defense Sites

**G A O**Accountability * Integrity * Reliability

Report Documentation Page		
Report Date 31JUL2001	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle ENVIRONMENTAL CONTAMINATION: Cleanup Actions at Formerly Used Defense Sites	Contract Number	
	Grant Number	
	Program Element Number	
Author(s)	Project Number	
	Task Number	
	Work Unit Number	
Performing Organization Name(s) and Address(es) U.S. General Accounting Office P.O. Box 37050 Washington, DC 20013	Performing Organization Report Number GAO-01-557	
Sponsoring/Monitoring Agency Name(s) and Address(es)	Sponsor/Monitor's Acronym(s)	
	Sponsor/Monitor's Report Number(s)	
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes		
Abstract The U. S. Army Corps of Engineers (Corps) estimates that it will spend at least \$15 billion to \$20 billion to clean up contamination and other hazards (hereafter hazards) at thousands of properties that were formerly owned, leased, possessed, or operated by the Department of Defense (DOD) or its components. These properties, located throughout the United States, are known as formerly used defense sites (FUDS). The properties may contain hazardous, toxic, and radioactive wastes in the soil and water or in containers such as underground storage tanks. Such wastes can contribute to mortality and serious illness, or pose a threat to the environment. Other hazards, including unexploded ordnance and unsafe buildings, may also be present on the properties. As of October 1, 2000, the Corps, states, and other parties had identified 9,171 properties for potential inclusion in the FUDS cleanup program. The Corps is responsible for cleaning up the hazards, including removing underground storage tanks, and demolishing unsafe structures.		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	

Classification of Abstract unclassified	Limitation of Abstract SAR
Number of Pages 27	

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
FUDS	Formerly Used Defense Sites
GAO	General Accounting Office
SARA	Superfund Amendments and Reauthorization Act of 1986



United States General Accounting Office
Washington, DC 20548

July 31, 2001

The Honorable John D. Dingell
Ranking Minority Member
Committee on Energy and Commerce
House of Representatives

The Honorable Tom Sawyer
House of Representatives

The U. S. Army Corps of Engineers (Corps) estimates that it will spend at least \$15 billion to \$20 billion to clean up contamination and other hazards (hereafter hazards) at thousands of properties that were formerly owned, leased, possessed, or operated by the Department of Defense (DOD) or its components. These properties, located throughout the United States, are known as formerly used defense sites (FUDS). The properties may contain hazardous, toxic, and radioactive wastes in the soil and water or in containers such as underground storage tanks. Such wastes can contribute to mortality and serious illness, or pose a threat to the environment. Other hazards, including unexploded ordnance and unsafe buildings, may also be present on the properties. As of October 1, 2000, the Corps, states, and other parties had identified 9,171 properties for potential inclusion in the FUDS cleanup program. The Corps is responsible for cleaning up the hazards, including removing underground storage tanks, and demolishing unsafe structures.

Concerned about the ongoing presence of defense-related hazards on property that is no longer controlled by DOD, you asked us to determine (1) how many properties identified for potential inclusion in the FUDS cleanup program are actually eligible for cleanup under the program and require or have required cleanup and (2) the geographic distribution, by state, of the potentially eligible FUDS properties and their locations, type(s) of hazard, including unexploded ordnance, and cleanup status. For those properties with unexploded ordnance, you also asked us to indicate if they are former training ranges, which often have large amounts of ordnance present after many years of use and may be costly to clean up. Our review of these issues encompassed all potentially eligible properties included in the Corps' FUDS inventory as of the end of fiscal year 2000.

Results in Brief

Most of the 9,171 properties identified as potential candidates for cleanup as formerly used defense sites are either not eligible for such cleanup or, if eligible, do not require it according to the Corps. Approximately 2,700 properties are eligible and may have one or more areas with hazards; the Corps has identified almost 4,500 individual cleanup projects to address these contaminated properties. According to the Corps' database, 2,382 of these projects were considered complete as of the end of fiscal year 2000. However, over 57 percent of the projects reported as complete were closed as a result of a study or administrative action without performing any actual cleanup action. In fact, nearly 800 of these projects were ones that the Corps initially thought were eligible but later determined were ineligible, usually because the contamination was caused by other parties after DOD relinquished control of the properties. The Corps classified these projects as complete as a way of closing them out. If DOD, in its annual report to the Congress on the status of its cleanup efforts, segregated projects that did not require cleanup from those projects where actual cleanup actions were required, it would provide a more accurate depiction of cleanup activity and progress. Specifically, our analysis indicates that the number of projects requiring cleanup would decline by about a third, and the relative portion of projects completed would drop from over half of all projects to less than a third. We are therefore making a recommendation to improve the clarity of DOD's reporting on the results of the FUDS cleanup program by excluding from the cleanup list those projects that were either closed as the result of a study or determined to be ineligible and by reporting such projects separately. In commenting on our report, DOD stated that it did not agree with the need to remove such projects from the list of completed projects but agreed to clarify in future annual reports that such projects were not cleaned up but were completed by other means.

The 9,171 potential FUDS properties currently identified are distributed across every state, the District of Columbia, and six U.S. territories and possessions. However, certain states have greater concentrations of these properties than others. For example, 10 states account for almost 52 percent of all potential FUDS properties. Unexploded ordnance and other explosive wastes may contaminate over 1,600 FUDS properties, of which about 750 are associated with former military training ranges according to a recent DOD survey. However, our review of the approximately 850 other FUDS properties that were not designated by the Corps as training ranges showed that at least 200 of these properties may be training ranges that should be included in DOD's range survey results. To improve the accuracy of DOD's range survey, we are making a recommendation that the Corps review these additional FUDS properties to determine which of

them are former training ranges and should be included in the range survey results. DOD agreed with this recommendation.

Information on individual potential FUDS properties, by state, and their locations, type(s) of hazard, and cleanup status is contained in appendix I. Detailed information on individual cleanup projects at these properties, by state, is contained in appendix II. Appendixes I and II are available only on the Internet at <http://www.gao.gov/GAO-01-1012SP/>.

Background

Identification, investigation, and cleanup of hazardous substances under DOD's FUDS program are authorized by the Defense Environmental Restoration Program (DERP). Such actions must be carried out consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which established DERP. The goals of the program also include the correction of environmental damage. To fund the program, SARA set up the Defense Environmental Restoration Account.

DOD has established specific goals for the cleanup of properties, including FUDS, that have hazardous, toxic, and radioactive wastes in the soil and water. These goals include having an approved cleanup process in place or cleanup complete at 100 percent of all such properties by the end of fiscal year 2014. DOD has not yet set any goals for projects involving hazardous, toxic, and radioactive waste in containers, unexploded ordnance, other explosive wastes, or unsafe building demolition.

Total spending for the FUDS cleanup program since fiscal 1984 is \$2.6 billion. During the most recent past five fiscal years (1997-2001), annual program funding for FUDS cleanup averaged about \$238 million, with program funding in fiscal year 2001 of \$231 million. The Corps' estimate of the additional cost to complete cleanup of the 4,467 currently identified projects is about \$13 billion, not including program management or support costs or inflation beyond fiscal year 2007. Also omitted from the estimated cost is a revised cost projection for the cleanup of unexploded ordnance, which resulted from a recent survey of DOD training ranges. According to Corps officials, the revised cost projection for ordnance cleanup would add another \$5 billion or more, depending on the level of cleanup selected, to the estimated cost to complete all FUDS projects. By the time all projects are completed, the Corps estimates that it will spend

at least \$15 billion to \$20 billion cleaning up FUDS properties.¹ At the current funding level, the Corps does not expect to meet the established goal of cleaning up FUDS properties with hazardous, toxic, and radioactive waste by fiscal year 2014, even if work could be deferred on all other projects, such as containerized wastes, unexploded ordnance, and building demolition, for which no goals have been established.

In deciding which actions, if any, need to be taken at a potential FUDS property, the Corps generally follows the process established for cleanup actions under CERCLA. The process usually includes the following phases:

- **Preliminary assessment of eligibility**—The Corps determines if the property is eligible for the FUDS cleanup program based on whether there are records showing that DOD formerly owned, leased, possessed, or operated the property or facility.² The Corps also identifies any potential hazard on the property related to DOD activities. The results of this assessment are detailed in an Inventory Project Report. If the property is eligible but there is no evidence of hazards, the property is categorized as requiring “no further action.”³
- **Site inspection**—The Corps inspects the site to confirm the presence, extent, and source(s) of hazards.
- **Remedial investigation and feasibility study**—The Corps evaluates the risk associated with the hazard; determines whether cleanup is needed; and, if so, selects alternative cleanup approaches.
- **Remedial action**—The Corps designs the remedy, performs the cleanup, and conducts long-term monitoring if necessary.

¹This estimate includes inflation only through fiscal year 2007.

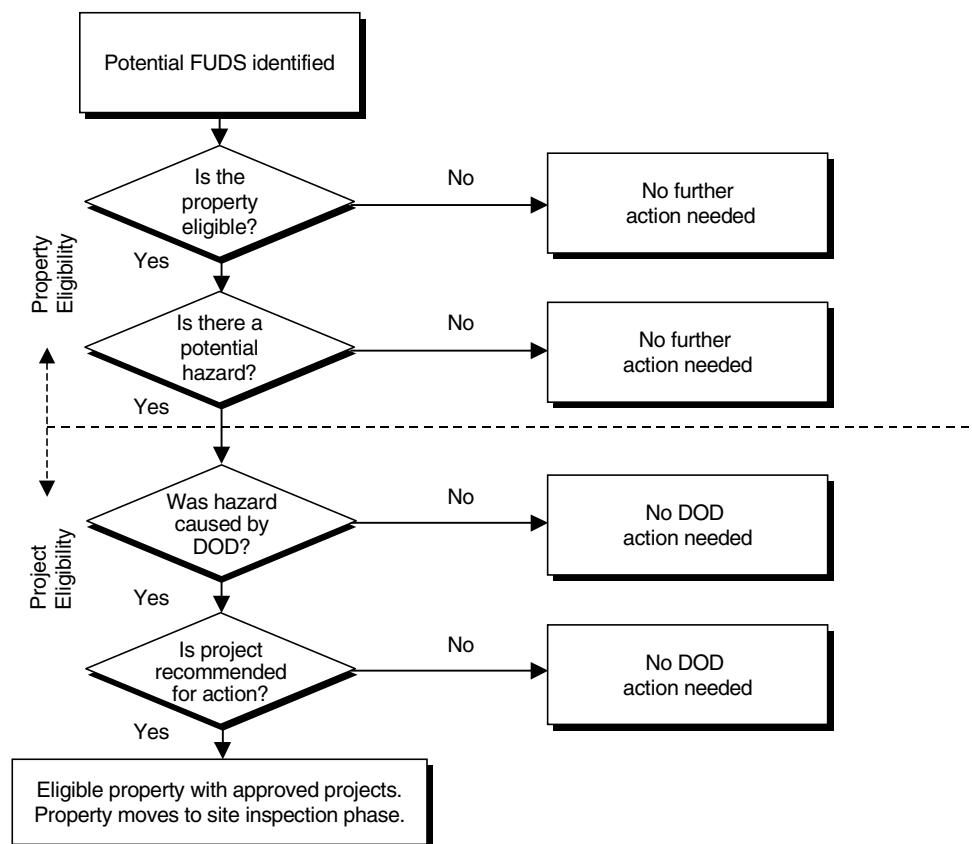
²As defined in Corps guidance, eligible properties are real property that was formerly owned, leased, possessed by, or otherwise under the jurisdiction of the Secretary of Defense within the 50 states and other areas over which the United States has jurisdiction. Eligible projects are those where there is contamination on the eligible property requiring cleanup, and where DOD has or shares potential responsibility for the hazardous conditions or is otherwise responsible for cleanup of the site under CERCLA.

³Beginning with fiscal year 2001, the FUDS program has changed this designation to “no DOD action indicated” (NDAI) and established subcategories that are relevant to later phases of the process. However, these changes were not incorporated into the database until March 2001.

When all of these steps have been completed for a given project, or if no cleanup is needed, the Corps considers the project to be “response complete.” After all projects at a property are designated as response complete, the property can then be closed out. Property closeout may require concurrence by federal or state regulators depending on the type of hazard involved.

A flow chart showing the decision process in the preliminary assessment of eligibility phase is shown in figure 1.

Figure 1: Decision Tree Flow Chart for the Preliminary Assessment of Eligibility Phase



Source: Prepared by GAO based on Army Corps of Engineers data.

Upon completion of the preliminary assessment of eligibility phase, a property enters the site inspection phase. The site inspection phase involves a more detailed examination of the property and related records

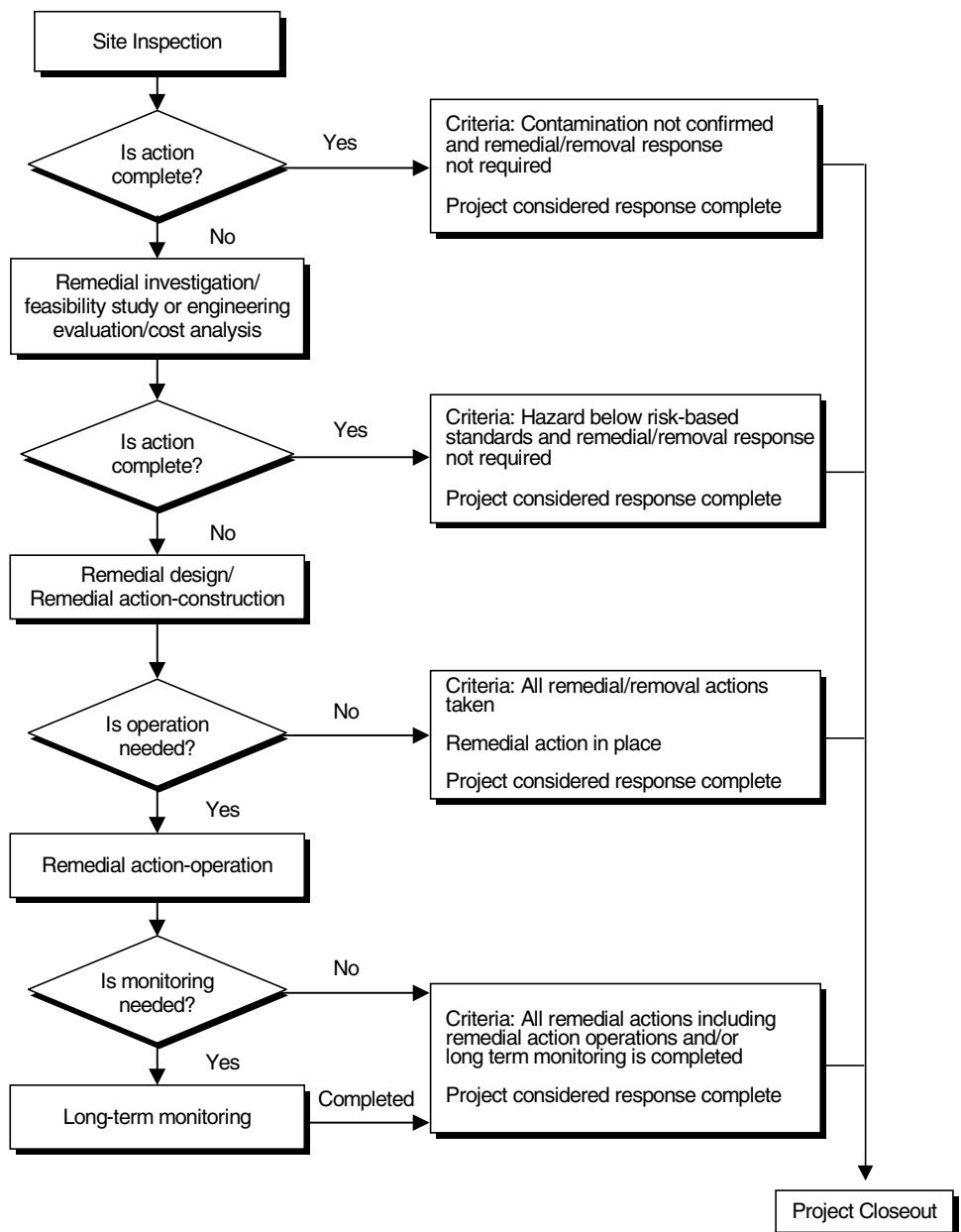
to confirm that a hazard exists and that a cleanup project is required to remove or reduce the hazard to a safe level. After the site inspection phase, the Corps conducts a remedial investigation to assess the risk posed by the hazard and determine if a cleanup is necessary. A feasibility study is then performed to select a cleanup approach.⁴ The Corps develops more detailed plans for constructing and carrying out the selected cleanup approach during the remedial design phase. A project next moves into the remedial action phase⁵. The remedial action phase can involve several steps including constructing or installing the selected cleanup approach, operating the approach, and long-term monitoring, if necessary.

A flow chart for the site inspection through long-term monitoring process is shown as figure 2.

⁴For some projects, an engineering evaluation and cost analysis are substituted for the remedial investigation and feasibility study phase. This phase is omitted for projects that involve waste in containers or building demolition; instead such projects move directly to the remedial design phase.

⁵In some cases, an interim removal action may be taken if a prompt or time-critical response is considered necessary.

Figure 2: Decision Tree Flow Chart for the Site Inspection Through Long-Term Monitoring Phases



Source: Prepared by GAO based on Army Corps of Engineers data.

Most Potential FUDS Properties Are Ineligible or Do Not Require Cleanup

Corps review of potential FUDS properties found that many properties are ineligible because they are still part of an active DOD installation or there are no records available showing that DOD ever owned or controlled the property. Many of the eligible properties did not require cleanup under the FUDS program because the Corps determined that no DOD-related hazards existed.

Many Potential FUDS Properties Are Ineligible Because DOD’s Presence Is Either Ongoing or Not Proven

As of October 1, 2000, there were 9,171 properties that had been identified by the Corps, the states, or other parties as potentially eligible for cleanup under the FUDS program.⁶ Of these properties, 9,055 had received a preliminary assessment of eligibility, 42 were still being assessed, and 74 properties had not been assessed yet. Based on preliminary assessments, the Corps determined that 6,746 properties were eligible and that 2,309 of the properties—more than a quarter of those assessed—were ineligible. In most cases, properties were ineligible either because the properties were still under DOD control (915) or because there were no records found showing that DOD had ever controlled the property (787). Table 1 shows the reasons that properties were found to be ineligible.

Table 1: Reasons That Potential FUDS Properties Were Ineligible	
Reason	Properties
Active DOD installation	915
Contaminated by an act of war	4
Defense Plant Corporation property	80
DOD component accepted cleanup responsibility or initiated cleanup	5
Not formerly, used, owned, or controlled by DOD	236
No records	787
Outside U.S. jurisdiction	12
Offshore ordnance property	5
Civil works property	48
Other	79
Excluded properties: cemeteries, recruiting stations, United Service Organization properties	138
Total	2309

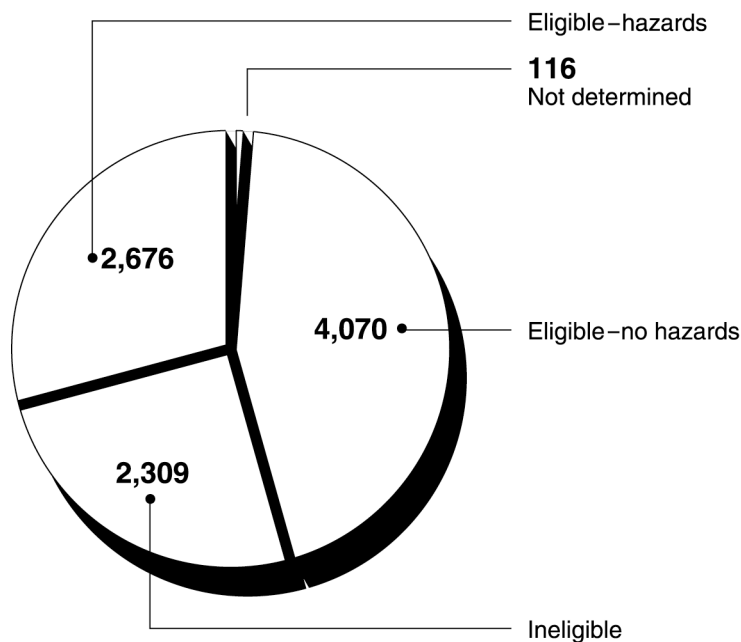
Source: Army Corps of Engineers.

⁶Another 677 properties were identified as potentially eligible but, after further investigation, were found to be duplicates of properties already on the list. The Corps maintains these properties on the inventory solely for the purpose of having a record of what became of them and the amount of money spent on them. Consequently, we have excluded these properties from our analysis.

Most of the Eligible Properties Do Not Require Cleanup

Although the Corps initially found that 6,746 properties were eligible for cleanup, the Corps subsequently determined, on the basis of site inspections, that most of these properties do not require cleanup after all. Specifically, the Corps determined that 4,070 properties either do not have any hazards requiring DOD cleanup or else have hazards that do not meet the level requiring cleanup.⁷ Hazards requiring cleanup were found on 2,676 of the eligible properties. Figure 3 shows the breakout of properties by eligibility and those where hazards were found.

Figure 3: Breakout of 9,171 Potentially Eligible FUDS Properties



Source: GAO's analysis of data provided by the Army Corps of Engineers.

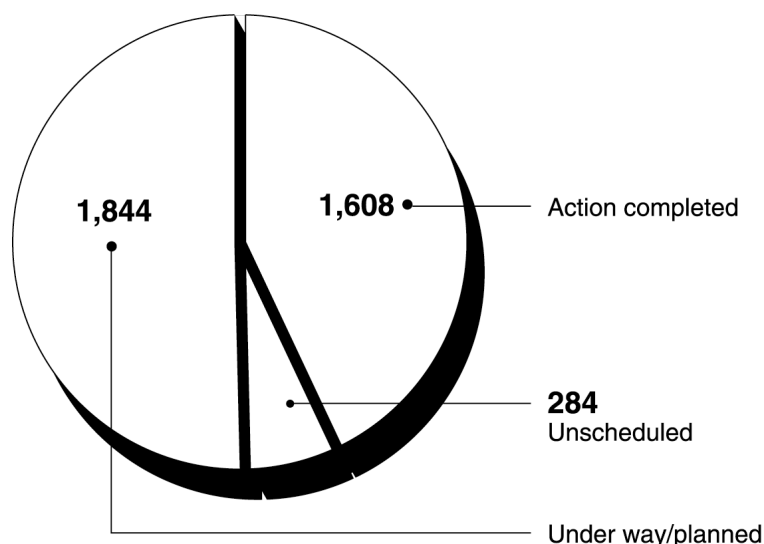
The Corps identified 4,467 distinct projects requiring cleanup at the 2,676 properties that were identified as having hazards needing cleanup. At 25 of

⁷The Corps makes its determination that no contamination or other hazards exist that require cleanup by the Corps without input from state or federal regulatory agencies, which may not agree. Such determinations are called "no further action." According to Corps officials, these determinations do not mean that action may not be required by other, subsequent users or owners of the properties to clean up contamination they caused. Corps officials emphasize that they are willing to reconsider the "no further action" determinations if evidence of contamination caused by DOD is found.

these properties, no specific projects have been identified as yet. However, after further investigation the Corps determined that projects identified at 405 properties were ineligible because other outside parties were responsible for contaminating the properties after DOD relinquished control. At another 33 properties, the identified projects were not recommended for further action or were not approved. The reasons for not recommending a project for further action or not approving a project varied. For example, the current landowner might have refused access to the property or might have already addressed the problem. The remaining 2,213 eligible properties had 3,736 projects requiring investigation and cleanup.

Of these projects, 284 were not yet scheduled for action, 1,844 projects were under way or planned, and 1,608 were completed. Figure 4 depicts the status of FUDS projects with hazards that required cleanup actions.

Figure 4: Status of 3,736 FUDS Cleanup Projects



Source: GAO's analysis of data provided by the Army Corps of Engineers.

DOD Reporting on FUDS Program Status Can Be Misleading

DOD reports on the status of its various environmental cleanup programs in an annual report to the Congress. However, as of the date of this report, DOD had not yet released its report for fiscal year 2000—the most recently completed fiscal year. According to the Corps' FUDS database, there were 2,382 completed FUDS projects as of the end of fiscal year 2000, or about 53 percent of the nearly 4,500 FUDS projects that required cleanup.⁸ The completed projects figure includes those removed from the active inventory either as a result of a study or an administrative action or as the result of an actual cleanup action such as removing toxic wastes or treating contaminated groundwater. In fact, our analysis showed that over 57 percent of the projects reported as complete did not require any actual cleanup and were reported as complete on the basis of a study or an administrative decision. For example, 183 of the 205 unexploded ordnance projects reported as complete were closed based on a study, while only 22 required an actual cleanup phase. Further, the completed figure includes 774 projects that were ineligible for cleanup as part of the FUDS program. The Corps initially thought that these projects were eligible but later

⁸The Corps database is updated frequently as new information on properties and projects becomes available. Accordingly, there can be some differences in the numbers discussed in various documents depending on when the information was obtained. Such differences are not material in the short term.

determined that they were ineligible because the contamination was caused by other parties after DOD relinquished control of the properties. The Corps made an administrative decision to classify these projects as “response complete” to remove them from its tracking system. If only the number of projects actually believed to require cleanup—3,148—was used as the basis for calculating cleanup progress, then only 1,020 projects or about 32 percent of those requiring cleanup have actually been cleaned up.

Further, according to Corps officials, most of the projects cleaned up to date were the least complex and least expensive ones, such as removing underground storage tanks (668 completed projects) or demolishing buildings (198 completed projects). On the other hand, many of the remaining cleanup projects are high cost and technologically difficult. Consequently, cleanup of the approximately 2,100 remaining projects will require at least \$13 billion⁹ (revised estimates may raise this to \$18 billion or more) and take more than 70 years to complete based on current planned funding of about \$200 million per year. According to Corps officials, reporting of completed FUDS projects follows DOD’s reporting policies for all its environmental cleanup areas such as base closures and active installations.

Geographic Distribution and Status of Potential FUDS Properties

The more than 9,000 properties identified as potential candidates for cleanup as FUDS are distributed across every state, the District of Columbia, and six U.S. territories and possessions.¹⁰ However, there are large concentrations of potential FUDS properties in certain states. For example, 10 states account for almost 52 percent of all the properties, while 27 states have more than 100 properties each and represent over 81 percent of all the properties. Figure 5 shows the geographic distribution of potential FUDS properties.

⁹This estimate includes inflation only through fiscal year 2007.

¹⁰The territories and possessions are American Samoa, Guam, the Northern Mariana Islands, Palau, Puerto Rico, and the U.S. Virgin Islands.

Map of the United States showing the number of properties owned by the top 100 owners in each state. The map is shaded in three categories: white for fewer than 100 properties, light gray for 100-199 properties, and dark gray for 200 or more properties. Each state is labeled with its abbreviation and the number of properties.

Legend:

- < 100 properties (White)
- 100-199 properties (Light Gray)
- 200 + properties (Dark Gray)

State Property Counts:

State	Properties
WA	323
OR	115
MT	107
ID	75
WY	70
ND	66
SD	91
MN	76
WI	68
MI	171
IL	156
IN	73
OH	91
PA	164
NY	484
ME	177
MA	279
RI	74
CT	54
NJ	175
DE	34
MD	102
DC	55
VA	278
NC	182
SC	206
GA	229
AL	171
MS	193
LA	87
TX	404
OK	111
KS	123
NE	101
CO	93
UT	55
NV	70
AZ	262
NM	240
CA	1088
AK	599
HI	377

Territories and Property Counts:

- American Samoa 30
- Guam 48
- Northern Mariana Islands 33
- Palau 14
- Puerto Rico 79
- U.S. Virgin Islands 11

Unexploded ordnance and other explosive wastes were believed to contaminate over 1,600 FUDS properties, of which 753 were associated with former training ranges according to a recent DOD survey. Our review of the over 800 properties not designated as training ranges in DOD's survey results showed that there may be 200 or more additional properties with training ranges that should be included in DOD's range survey results.

Eligibility and Status of Potential FUDS by Geographic Location

As discussed previously, most of the 9,171 potential FUDS are either ineligible for the cleanup program (2,309 properties) or do not require any environmental cleanup (4,070 properties) according to assessments made by the Corps; 116 properties were still being reviewed for eligibility and potential hazards. The remaining 2,676 properties were found to have sufficiently high levels of hazards to require cleanup. Of these, 463 properties were excluded because other parties were deemed responsible for the hazard (405 properties), or because no specific project had been identified as yet (25 properties), or because no projects had been identified or approved for further action (33 properties). Table 2 summarizes the eligibility status of the potential FUDS by geographic location.

Table 2: Eligibility and Status of 9,171 Potential FUDS Properties by Geographic Location

State	Potential FUDS	Eligibility status			Eligible property hazards		Property status	
		Still under review ^a	Ineligible property	Eligible property	No hazards found	Potential hazards found	Other ^b	Properties requiring cleanup
AK	599	33	49	517	391	126	17	109
AL	171	2	48	121	97	24	6	18
AR	82	0	5	77	64	13	1	12
AZ	262	0	72	190	105	85	26	59
CA	1088	19	300	769	397	372	65	307
CO	93	0	47	46	16	30	4	26
CT	54	0	9	45	23	22	5	17
DC	55	1	5	49	22	27	0	27
DE	34	0	3	31	20	11	2	9
FL	647	9	149	489	339	150	59	91
GA	229	0	85	144	100	44	18	26
HI	377	0	74	303	233	70	2	68
IA	34	0	9	25	12	13	1	12
ID	75	4	15	56	44	12	3	9
IL	156	1	40	115	53	62	8	54
IN	73	1	21	51	34	17	0	17
KS	123	0	10	113	44	69	1	68
KY	24	0	7	17	13	4	1	3
LA	87	0	16	71	55	16	2	14
MA	279	3	36	240	129	111	31	80
MD	102	1	22	79	37	42	11	31
ME	177	21	26	130	67	63	13	50
MI	171	1	68	102	38	64	8	56
MN	76	0	8	68	48	20	3	17
MO	88	0	9	79	53	26	0	26
MS	193	0	67	126	93	33	7	26

State	Potential FUDS	Eligibility status		Eligible property hazards			Property status	
		Still under review ^a	Ineligible property	Eligible property	No hazards found	Potential hazards found	Other ^b	Properties requiring cleanup
MT	107	1	55	51	34	17	4	13
NC	182	0	86	96	60	36	4	32
ND	66	0	52	14	10	4	0	4
NE	101	0	31	70	15	55	6	49
NH	28	0	3	25	14	11	0	11
NJ	175	0	60	115	71	44	8	36
NM	240	0	17	223	85	138	3	135
NV	70	7	5	58	27	31	12	19
NY	484	0	215	269	172	97	11	86
OH	91	1	21	69	43	26	1	25
OK	111	0	4	107	54	53	8	45
OR	115	0	16	99	72	27	2	25
PA	164	1	32	131	62	69	27	42
RI	74	0	6	68	26	42	10	32
SC	206	2	126	78	47	31	7	24
SD	91	0	40	51	18	33	2	31
TN	66	0	26	40	23	17	8	9
TX	404	0	42	362	195	167	28	139
UT	55	1	13	41	24	17	0	17
VA	278	3	111	164	125	39	3	36
VT	12	0	4	8	2	6	1	5
WA	323	3	35	285	227	58	5	53
WI	68	0	16	52	27	25	1	24
WV	26	0	10	16	6	10	3	7
WY	70	0	36	34	12	22	2	20
AS ^c	30	0	1	29	21	8	0	8
CN ^c	33	1	6	26	4	22	0	22
GM ^c	48	0	8	40	22	18	2	16
PR ^c	79	0	19	60	37	23	10	13
PT ^c	14	0	12	2	2	0	0	0
VI ^c	11	0	1	10	6	4	1	3
Total	9,171	116	2,309	6,746	4,070	2,676	463	2,213

^aIncludes 74 properties where the preliminary assessments were not completed and 42 properties where the preliminary assessments were completed but eligibility was not yet determined.

^bIncludes 405 properties where other parties were deemed responsible for the hazard, 25 properties where no projects were identified yet, and 33 properties where the identified projects were not recommended or not approved to go forward.

^cAmerican Samoa (AS), the Northern Mariana Islands (CN), Guam (GM), Palau (PT), Puerto Rico (PR), the U.S. Virgin Islands (VI).

Source: Army Corps of Engineers.

For the remaining 2,213 properties, a total of 3,736 projects were identified and approved for further action. The status of these projects varies from those that were only recently identified and have had no cleanup action taken as yet to those that are completed.

Information on individual properties, by state, including the property name, location, congressional district, eligibility, existence of hazards, number of eligible projects, estimated costs incurred to date, and estimated cost to complete cleanup is contained in appendix I. Information on individual projects, by state, including the property name, location, congressional district, project number, type(s) of hazard, risk level, status of cleanup, cleanup remedy used, costs incurred to date, and estimated cost to complete cleanup is contained in appendix II. These appendixes are available only on the Internet at <http://www.gao.gov/GAO-01-1012SP/>.

DOD's Range Survey May Not Include All FUDS Ranges

In response to the Senate Armed Service's Committee direction to develop more complete information on the estimated cost to conduct environmental cleanup at training ranges, DOD conducted a survey of training ranges at its active, closing, and closed facilities to determine which ones might contain unexploded ordnance.¹¹ Because DOD does not have a complete inventory of its training ranges, the amount of funding necessary to clean up training ranges has been unreliable and is believed to be significantly understated.¹² DOD's survey results indicated that 753 FUDS properties that might contain unexploded ordnance should be classified as training ranges. For a variety of reasons, over 800 FUDS properties were not included in DOD's survey. Many of these properties were excluded because the Corps had previously decided that, although there might be unexploded ordnance or other explosive wastes present, no further action was needed to address the hazards at these properties. We reviewed basic information about these properties, such as the name of the property and the project description, to see if there could be additional ranges not reported as part of DOD's survey. For example, if a project with ordnance or explosive wastes was located at property that was named "Bombing Range" or "Bombing Target" or was described as an ordnance or explosive wastes cleanup project at a bombing range or bombing target,

¹¹*Senate Report on the National Defense Authorization Act for Fiscal Year 2000* (S. Rep. No. 106-50, May 17, 1999).

¹²*Environmental Liabilities: DOD Training Range Cleanup Cost Estimates Are Likely Understated* (GAO-01-479, Apr. 2001).

we concluded that these properties were likely training ranges. We found over 200 properties that could be ranges based on such criteria.

Conclusions

DOD's annual report on the status of its environmental restoration activities can provide a misleading picture of FUDS program accomplishments. In its annual report, DOD accounts of completed projects include projects that were determined to be ineligible or that did not involve any actual cleanup effort, as well as projects that required actual cleanup actions to complete. As a result, it appears that after 15 years and expenditures of \$2.6 billion, over 50 percent of the FUDS projects have been completed. In reality, only about 32 percent of those projects that required actual cleanup actions have been completed, and those are the cheapest and least technologically challenging. The Corps estimates that the remaining projects will cost over \$13 billion and take more than 70 years to complete. The Corps' reporting of completed FUDS projects reflects DOD's reporting policies for all of its environmental cleanup programs, including those at closing bases and active installations. As such, progress on those cleanup programs may not be accurately pictured either.

In addition, DOD's range survey did not include all FUDS properties that may contain unexploded ordnance and could be former training ranges. Consequently, DOD's inventory of FUDS training ranges is likely incomplete, and its estimated cost to clean up these ranges is likely understated.

Recommendations

The Secretary of Defense should clarify DOD's reporting of the cleanup progress at FUDS and for other DOD cleanup activities by excluding projects from its "completed" list that were closed solely as a result of a study or administrative action and did not require actual cleanup. Such projects should instead be reported as eligible properties where a hazard either was not found or did not require cleanup because it was below the threshold level or because it resulted from another party's actions. Similarly, DOD's annual report should exclude projects from its "completed" list that were determined to be ineligible for cleanup under the FUDS program.

To improve the accuracy of DOD's FUDS training range survey results and its estimate of the costs related to environmental cleanup at these ranges, the Secretary of Defense should direct the Corps to review the FUDS properties that were excluded in DOD's initial survey to determine if any are training ranges that should be included in the survey.

Agency Comments and Our Evaluation

DOD provided oral comments that generally agreed with the need to clarify reporting on the status of the FUDS program and to review the unexploded ordnance projects that were excluded from its initial training range survey. DOD did not agree with the need to exclude from the list of completed projects those projects closed either as the result of a study or because they were determined to be ineligible. However, DOD did agree that it needs to clarify in future annual reports to the Congress that the restoration efforts on some projects were completed with a study phase and not a cleanup action. DOD did not specifically address how it would report on the ineligible projects that were being reported as completed.

DOD also provided a number of technical comments and clarifications related to specific numbers and dollar figures in the report, which we addressed as appropriate in the body of the report.

Scope and Methodology

The scope of this review encompassed all potentially eligible properties included in DOD's FUDS inventory as of the end of fiscal year 2000.

To obtain information on the number of potential FUDS properties that are eligible and require or have required cleanup and on the geographic distribution, by state, of FUDS properties, we relied primarily on the Corps database of FUDS properties.

To obtain information on those FUDS properties that contain or contained ordnance and other explosive wastes, we also relied on the Corps database of FUDS properties and on a database constructed by the Corps to respond to DOD's range survey. We then compared those databases to determine which properties were included as part of the range survey and which were not. For those that were not included, we reviewed the property name and project description information to determine if there were additional properties that could be ranges based on these descriptors.

The data in this report represent a static point in time—the end of fiscal year 2000. The Corps database of FUDS properties is used by the Corps on a daily basis to plan, schedule, and monitor the FUDS program, so there are constant changes and updates. Consequently, the numbers presented in this report may vary somewhat from other published sources; however, such variations represent the changing status of individual properties and projects, not material changes in the overall program status. On an overall level and as a measure of the FUDS program's scope and efforts, we believe that these data represent a reasonable picture of the program at the end of fiscal year 2000.

The Corps database of FUDS properties incorporates data from a previous Corps effort that did not contain all of the various categories of data in the current database. Consequently, for some properties and projects, particularly those that are no longer active, some information is dated and may not reflect current property conditions. We reviewed the Corps' policies and procedures to verify the reliability of these data and found them to be reasonably accurate for our use. To the extent that we found material errors in the data, we worked with the Corps to correct those errors. We did not, however, attempt to independently assess the reliability of the data.

We also acquired and reviewed program documents and interviewed Corps officials from headquarters, division, and district offices to obtain information about the FUDS program. We did not ask state officials to verify or confirm the Corps data for this review. We also contacted DOD and Environmental Protection Agency officials about aspects of the FUDS program.

We conducted our review from November 2000 through May 2001 in accordance with generally accepted government auditing standards.

As arranged with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this letter. We will then send copies to the Secretary of Defense; the Director, Office of Management and Budget; the appropriate congressional committees; and other interested parties. We will also provide copies to others on request.

If you or your staff have any questions regarding this report, please call me or Edward Zadjura on (202) 512-3841. Key contributors to this assignment were Patricia Foley-Hinnen; Susan Irwin; Arthur James, Jr.; Robert Kigerl; and Cynthia Norris.

A handwritten signature in black ink that reads "Gary L. Jones". The signature is written in a cursive, flowing style.

(Ms.) Gary L. Jones
Director, Natural Resources and Environment

Appendix I: Properties Identified for Potential Inclusion in the FUDS Cleanup Program

Appendix I contains summary data on all 9,171 properties identified for potential inclusion in the FUDS cleanup program. The properties are listed by state, the District of Columbia, and six U.S. territories and possessions. For each property, the data include the property name, Corps' property number, the county and congressional district where the property is located, the eligibility status, and whether hazards are present. Also included for eligible properties with hazards are the number of eligible cleanup projects, the actual cleanup-related costs incurred to date, and the estimated cost to complete the cleanup projects. All information is reported as of the end of fiscal year 2000.

Appendix I is available only on the Internet at <http://www.gao.gov/GAO-01-1012SP/>.

Appendix II: Cleanup Projects on FUDS Properties

Appendix II contains summary data on the 2,213 eligible properties with hazards that have cleanup projects. The projects are listed by state, the District of Columbia, and six U.S. territories and possessions. For each project, the data include the property name, the Corps' property number, county and congressional district where the property is located, the Corps' project number, the type of hazard on the property, and the risk posed by the hazard. In addition, information is provided on whether or not the project has been scheduled to begin, is planned or under way, or has been completed, with actual or estimated dates for commencement and completion. The type of cleanup remedy selected for the project is also indicated. Finally, the actual cleanup-related cost incurred to date and the estimated cost to complete each project are provided. All information is reported as of the end of fiscal year 2000.

Appendix II is available only on the Internet at <http://www.gao.gov/GAO-01-1012SP/>.

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United States General Accounting Office

ENVIRONMENTAL CONTAMINATION: Cleanup Actions at Formerly Used Defense Sites

GAO-01-1012SP, August 2001

Introduction to Appendixes I and II

The U. S. Army Corps of Engineers (Corps) estimates that it will spend at least \$15 billion to \$20 billion to clean up contamination and other hazards (hereafter hazards) at thousands of properties formerly owned, leased, possessed, or operated by the Department of Defense (DOD) or its components. These properties, located throughout the United States, are known as formerly used defense sites (FUDS). The properties may contain hazardous, toxic, and radioactive wastes in the soil and water or in containers such as underground storage tanks. Such wastes can contribute to mortality and serious illness, or pose a threat to the environment. Other hazards, including unexploded ordnance and unsafe buildings, may also be present on the properties.

Concerned about the ongoing presence of defense-related hazards on property that is no longer controlled by DOD, John D. Dingell, Ranking Minority Member, Committee on Energy and Commerce, House of Representatives, and Representative Tom Sawyer asked us to determine

- how many properties identified for potential inclusion in the FUDS cleanup program are actually eligible for cleanup under the program and require or have required cleanup, and
- the geographic distribution, by state, of the potentially eligible FUDS properties and their locations, type(s) of hazard, including unexploded ordnance, and cleanup status.

For those properties with unexploded ordnance, Representatives Dingell and Sawyer also asked us to indicate if the properties are former training ranges, which often have large amounts of ordnance present after many years of use and may be costly to clean up.

Our findings are reported in *Environmental Contamination: Cleanup Actions at Formerly Used Defense Sites*. [Appendix I](#) of this report provides detailed information on individual properties, and [appendix II](#) provides detailed information on individual cleanup projects on those properties.

Full Report: *Environmental Contamination: Cleanup Actions at Formerly Used Defense Sites* ([GAO-01-557](#))

GAO contacts: (Ms.) Gary L. Jones or Edward Zadjura on (202) 512-3841

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